

BACOPA EGENSIS (POEPPIG) PENNELL (SCROPHULARIACEAE) IN THE UNITED STATES

CHARLES E. DEPOE

*Department of Biology, Northeast Louisiana State
College, Monroe, Louisiana 71201*

INTRODUCTION

The genus *Hydrantheium* (Scrophulariaceae) was described by Humboldt, Bonpland, and Kunth in 1825 based upon the species *H. callitrichoides*. Since then, additional species have been described and the genus has been redefined as a subsection of the genus *Bacopa*.

The genus is normally considered to be neotropical; however, *B. egensis* (Poeppig) Pennell has been reported from Africa (Bentham and Hooker, 1862) and a specimen is available from the Belgian Congo (MO no. 1639137). *Bacopa egensis* has been reported also from the United States (Wood, 1870 and 1889; Mann, 1872; Chapman, 1878, 1889; Gray, 1888; and Small, 1903) based upon collections of Josiah Hale in the early 1800's. In light of a recent rediscovery of this species in Louisiana, of the paucity of extant specimens in U.S. herbaria, and of confusion which exists in the literature concerning this species in the United States, this review was prepared.

DESCRIPTION

Bacopa egensis grows in shallow water along the edges of quiet bodies of water (sometimes on shore slightly above water). Its stems are lax, aerenchymous, borne radiating from a common root system (but frequently rooting at the nodes when buried), and up to 3 dm or so in length. The leaves are mainly floating, opposite, borne in a rosette-like fashion at each stem apex (as the stem matures, elongation of the internodes leaves behind one pair of opposite leaves at each node but these normally soon begin to disintegrate); mature leaves broadly spatulate, crenate distally (the first pair of leaves produced by a new stem apex are more-or-less oblong and entire but later pairs appear progressively more similar to the mature form); main veins 5-6 (-9), parallel through the petiole but diverging in the blade; petiole flat with aerenchyma between the main veins (but not inflated), petiole bases clasping the stem (those of a pair appearing as slightly joined to either side of the stem); leaves estipulate, valvate in bud. Flowers ebractate, actinomorphic, borne 1-2 per leaf axil, pedicellate (mature pedicels up to 11-12 mm in length). Sepals 4, greenish, connate about ½ their length into calyx tube, length (from base of tube to apex of lobe)

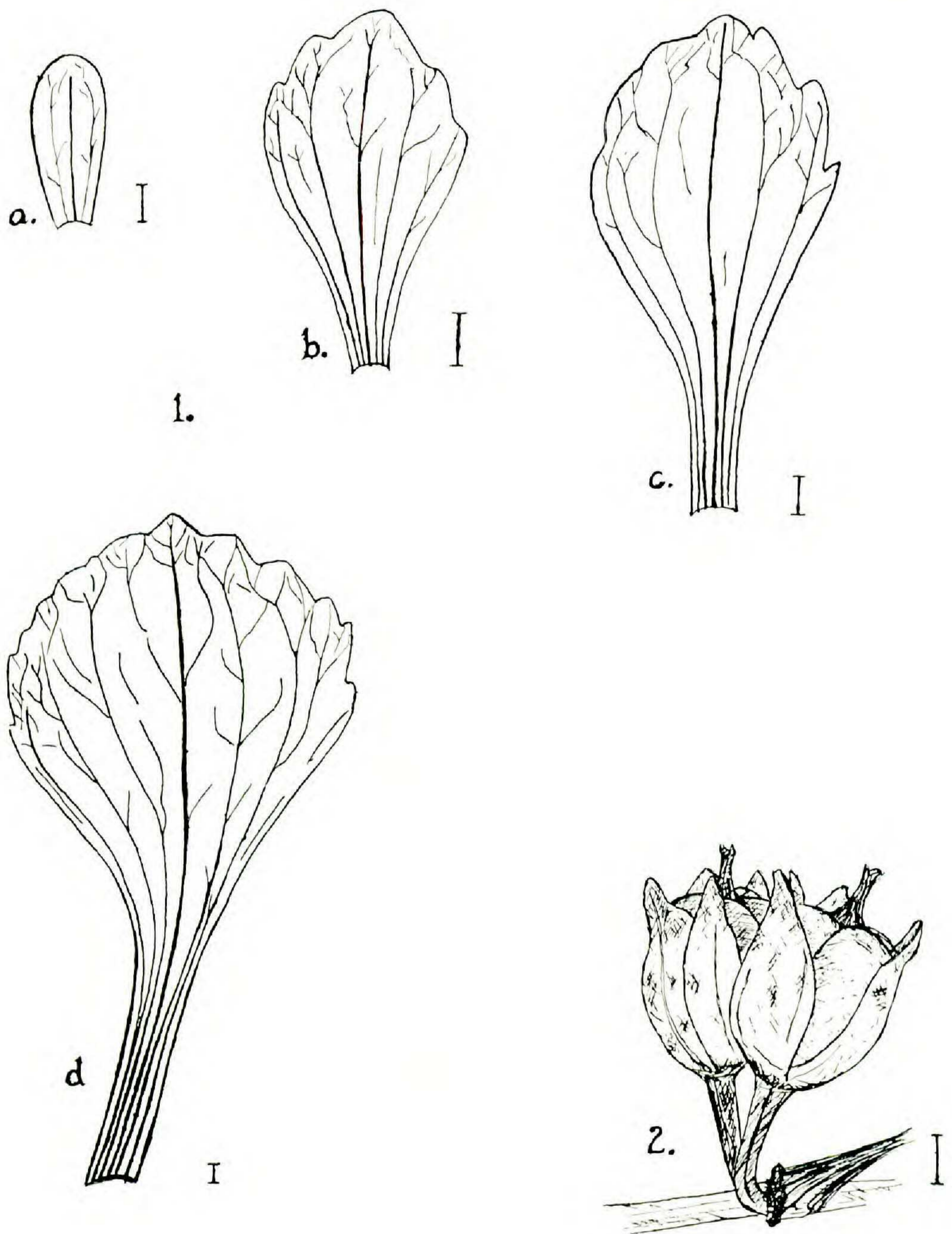


Fig. 1. Leaves of *Bacopa egensis*: a. first leaf, b. second leaf, c. third leaf, d. mature leaf (lines represent 1 mm.).

Fig. 2. Mature fruits of *Bacopa egensis* (line represents 1 mm.).

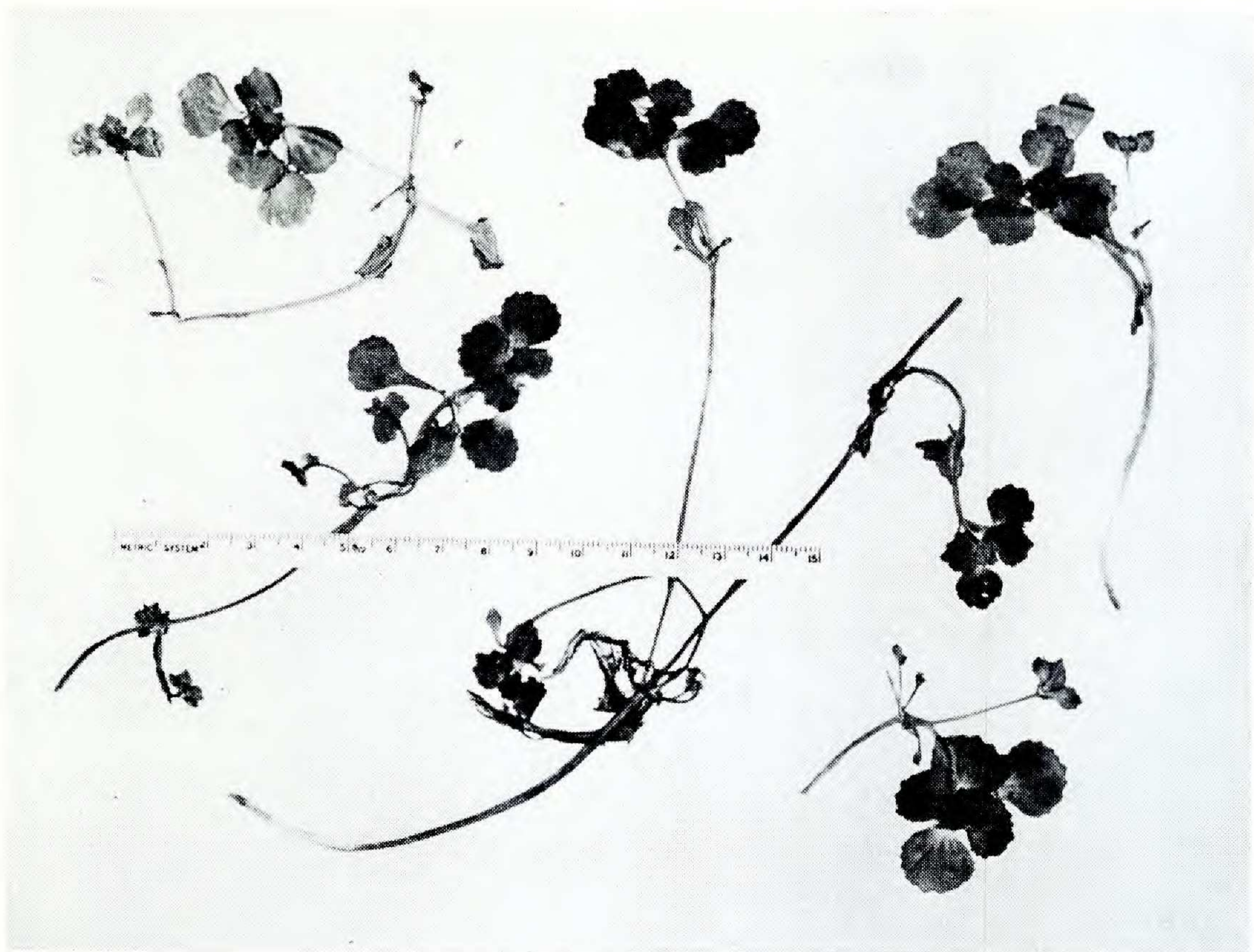


Fig. 3. Specimens of *Bacopa egensis*.

2½-3 mm, lobes reflexed in mature flower, acute; calyx persistent and enclosing maturing fruit. Petals 3, white with bluish streaks, connate for about ½ their length into corolla tube, length (from base of tube to apex of lobe) 3½-4½ mm, lobes apically cupped and imbricate in bud (enclosing androecium and gynoecium) but spreading (to reflexed) in mature flower, rounded at apex; corolla deciduous at maturity. Stamens 3; anthers dorsifixed, blue to violet in color, bilobed with lobes distinct (except where united with filament) (in one specimen, one of the 3 filaments bore 2 bilobed anthers—the inner lobe of each being aberrant at its base in the area of attachment to the filament); stamens alternate with corolla lobes, epipetalous with filaments inserted in sinuses of corolla lobes, total length of stamen slightly less than corolla lobes. Style 1, bifurcate at apex; stigmas 2, about equal with midpoint of anthers in mature flowers. Ovary bilocular, superior, placentation axile, ovules numerous, orthotropous; seeds minute, striated, elongate (shaped like a small banana); fruit globular, topped by persistent style and surrounded by persistent sepals (which exceed it in length giving the appearance of 4 small “horns”).

TAXONOMY

Pennell, in his 1935 monograph of the Scrophulariaceae, discussed the basic similarities to be found among several of the then recognized aquatic genera of the family (e.g., *Herpestis* or *Monniera*, *Hydrantheium*, and *Macuillamia*) and states these, “. . . form an association of nearly related genera that tend to vary in the same structures. . . .” Of these genera he states, “Weakest of all may well be *Macuillamia*, likely to be reduced at least to *Hydrantheium*.” Although retaining the genera as distinct in the main text, on pp. 629 and 630 (of “Additions and Corrections”) he further discussed the relationship and concluded that the members of the genus *Hydrantheium* HBK, “. . . are to be considered merely as florally reduced members of a common genus . . . ,” which would include from the United States, the species *Monniera rotundifolia* Mich., *Macuillamia obovata* Raf., *Gratiola repens* Sw., and *Hydrantheium egense* Poeppig, and which, because of priority, should bear the name *Hydrantheium*. In 1946, Pennell further discussed this concept and concluded that his 1935 genus *Hydrantheium*, as well as other genera, exhibited evolutionary reduction in a clinal manner and, therefore, should be grouped together. To this end, he redefined the genus *Bacopa* and established *Hydrantheium* as a subsection within the section *Herpestis*; including within this subsection taxa previously belonging to such genera as *Hydrantheium*, *Herpestis*, *Macuillamia*, and *Bacopa*. This treatment has been followed, at least in part, by more recent workers (e.g., Barroso, 1952; Fernald, 1950; and Gleason and Cronquist, 1963). Included in synonymy with *Hydrantheium* should be *Hydrathelium*, an apparent typographical error by Pennell, 1921, page 464.

The name *Hydrantheium egense* Poeppig and Endlicher, as well as *H. egense* Poeppig, should be placed in synonymy under *Bacopa egensis* (Poeppig) Pennell. Bentham and Hooker (1862) credited the name *H. egense*, to Poeppig and Endlicher as did Small (1903) while Pennell (1921, 1936, 1946) and Gray (1888) cited Poeppig as the only author. Chapman (1878) and Mann (1872) also list Poeppig as the author but followed by a question mark (although the latter may have been placed to question the presence of the species and not the author). This confusion evidently arose from the method of publication of the original name. *Nova genera ac species plantarum* was published in three volumes, the first two by Poeppig and Endlicher and the third by Poeppig alone. Since *H. egense* was described in the third volume, the author's name should be, as later authors have indicated, only Poeppig.

When Wood first listed the species from the United States (1870), he did so under the name of *H. crenatum*, following a description of the genus accredited properly to Humbolt, Bonpland, and Kunth. The description he gives of *H. crenatum* matches that of *H. egense* Poeppig and he cites specimens of Hale which were labelled *H. egense*. Wood makes no explanation of his name *H. crenatum* and no other reference to the name is in the literature. *H. crenatum* Wood, therefore, should be placed in synonymy under *Bacopa egensis*.

UNITED STATES RECORDS

Bacopa egensis was first collected in the United States by Dr. Josiah Hale in the early 1800's. The first mention in the literature was by Wood (1870) who gives the data, "Pools, Miss., La. (Dr. Hale)." Chapman (1878, 1889) again cites Hale's specimens but gives the location as New Orleans as does Gray (1888) who states, ". . . picked up in New Orleans by the late J. Hale. . . ." Small (1903) gives the location as, "In swamps, near New Orleans, Louisiana," and adds, "Not collected recently." Pennell (1921, 1935) again cites Hale's specimens but credits these to, "Louisiana. Rapides Parish: Alexandria."

In order to verify the location of Hale's collecting site (or sites), I attempted to obtain his specimens. Pennell (1935) cited these from NY and GH, and since Pennell worked with the Philadelphia Academy of Sciences, these three herbaria were contacted. In addition, inquiries were made of YU, US, NO, MO, and LSU. The only specimens of Hale's which apparently are extant are four at NY. According to N. H. Holmgren of the herbarium (1966, personal communications), the labels of two of these read, "Dr. Hale, Louisiana," the third merely has "Louisiana," and the fourth reads, "Dr. Hale, Alexandria." No other information, including dates, is present.

To help clarify the question as to Hale's collecting sites, Dr. Joseph Ewan kindly furnished me a biographic sketch of Hale, from the New Orleans Academy of Sciences minute book of 1854 to 1857. From 1822 to 1824, Dr. Hale lived in Port Gibson, Mississippi; in 1824 and 1825, he spent time travelling, ". . . mostly in Louisiana and studying the wild vegetable productions of the South . . . "; from 1825 to 1828, he lived on a plantation 20 miles from Alexandria, La.; from 1828 to 1850, he lived in Alexandria; from 1850 to 1855, he lived in New Orleans; and in 1855 he moved to Canton, Miss., where he lived until his death in July 1856. Not only did Hale's places of residence allow for his collecting in all of the places to which his collections have been credited but, also, from 1834 to 1850 he lived in retirement and, ". . . wholly devoted himself to the study of plants and other objects of Natural History." The only key to this is his NY specimen labelled "Alexandria" but this does not preclude his having collected other specimens in other locations.

The second apparent collection of the species in the United States was by Dr. Neil Hotchkiss. He has informed me (1966, personal communication) that in October 1933, he found a plant, in Catahoula Lake, LaSalle Parish, La., which he tentatively identified as *H. egense*. The specimen, however, is no longer extant.

On 25 September, 1966, while collecting for my survey of the aquatic plants of Louisiana, I encountered the species in Old River, LaSalle Parish, Louisiana. Subsequent finds by myself, as well as by Dr. John Thieret of the University of Southwestern Louisiana and Dr. E. R. Barrett of Northeast Louisiana State College, have shown that the species is present also in Grant and Rapides Parishes and that it apparently is firmly established and growing

in abundance. It is generally found in shallow, fairly quiescent, open water in the type of habitat occupied by *Bacopa rotundifolia* (Michx.) Wettst., with which it is frequently intermingled and which it superficially resembles. Specimens of my material were sent to NY for comparison with Hale's and, according to Mr. Holmgren, Hale's ". . . match up with your collection almost to a tee."

Previous authors, basing their comments on Hale's specimens, considered the species to be a "ballast waif" and "transient" in the United States. The recent finds refute this and the taxon should be added to our flora. Catahoula Lake, in which the species is firmly established, is a major stopover location for waterfowl migrating in the Mississippi flyway and it seems reasonable to assume the species was introduced from South America through transport by birds, as suggested by Pennell (1935).

REFERENCES

- BARROSSO, G. M. 1952. Scrophulariaceae indigenas e exoticas no Brasil. (Separata de) *Rodriguesia*. 15 (27): 9-64.
- BENTHAM, G. & J. D. HOOKER. 1862. *Genera plantarum*. London.
- CHAPMAN, A. W. 1878. An enumeration of some plants—chiefly from the semi-tropical regions of Florida—which are either new, or which have not hitherto been recorded as belonging to the flora of the southern states. *Bot. Gaz.* 3 (2): 1-12ff.
- CHAPMAN, A. W. 1889. *Flora of the southern United States*. Ivison, Blakeman, and Co., N.Y.
- FERNALD, M. L. 1950. *Gray's manual of botany*. Am. Book Co., N.Y.
- GLEASON, H. A. & A. CRONQUIST. 1963. *Manual of vascular plants of the north-eastern United States and adjacent Canada*. D. VanNostrand Co., Inc., Princeton.
- GRAY, A. 1888. *Synoptical flora of North America: Gamopetalae after Compositae*. Smithsonian Inst., Washington, D.C.
- HUMBOLDT, A. DE, A. BONPLAND, and C. S. KUNTH. 1825. *Nova genera et species plantarum*. Paris.
- MANN, B. P. 1872. *Catalogue of the phaenogamous plants of the United States*. 2nd ed. Publ. by the author.
- NEW ORLEANS ACADEMY OF SCIENCES. *Minute Book*; Dec. 18, 1854 - Dec. 7, 1857. pp. 392-395.
- PENNELL, F. W. 1921. Scrophulariaceae of the west Gulf states. *Proc. Acad. Phil.* 71: 224-291.
- PENNELL, F. W. 1935. *The Scrophulariaceae of eastern temperate North America*. *Phil. Acad.*, Monogr. 1, 650 pp.
- PENNELL, F. W. 1946. Reconsideration of the *Bacopa-Herpestis* problem of the Scrophulariaceae. *Proc. Acad. Phil.* 98: 83-98.
- POEPPIG, E. 1845. *Nova genera ac species plantarum*. Lipsiae. 3: 75-76, tab. 286.
- SMALL, J. K. 1903. *Flora of the southeastern United States*. Publ. by the author.
- WOOD, A. 1870. *The American botanist and florist*. Am. Book Co., N.Y.
- WOOD, A. 1889. *The new American botanist and florist*. 2nd ed. Am. Book Co., N.Y.